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L'Audi h-tron quattro concept

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Le matériel et les données spécifiées dans le présent document se réfèrent à la gamme de modèles proposée en Allemagne. Sous réserve de modifications sans préavis ; sauf erreurs et omissions.



Résumé

Zéro émission : l'Audi h-tron quattro concept

Design valorisant, ravitaillement rapide et performances sportives peuvent décrire l'Audi h-tron quattro concept. Cette voiture unique combine une pile à combustible pouvant atteindre jusqu'à 110 kW (150 ch) avec une puissante batterie capable de fournir un surplus temporaire de 100 kW (136 ch). Le véhicule peut être entièrement ravitaillé en hydrogène en environ quatre minutes, ce qui lui permet de parcourir jusqu'à 600 kilomètres.

En 2017, et notamment avec la prochaine génération de l'Audi A8, le constructeur d'Ingolstadt intégrera sur ses véhicules de nouvelles technologies pour la conduite pilotée et le stationnement. Les nouvelles technologies nous offrent déjà un aperçu des avancées à venir.

L'Audi h-tron quattro concept est un nouveau pas vers le futur. Avec sa batterie hybride rechargeable, son moteur à pile à combustible, il maîtrise toutes les technologies de propulsion alternatives et offre des solutions sur mesure.

L'Audi h-tron quattro concept est étroitement liée au concept Audi e-tron quattro. Ce dernier, un SUV totalement électrique, a été présenté au Salon de Francfort en 2015. Les deux concepts, particulièrement flexibles, sont basés sur la deuxième génération de plate-forme modulaire longitudinale (MLB Evo). Les deux véhicules utilisent tous les deux un plancher virtuel identique même si leurs technologies divergent.

L'Audi h-tron quattro concept est la cinquième génération de véhicule utilisant la technologie de pile à combustible de Audi et Volkswagen. Des matériaux plus légers réduisent le poids du véhicule, améliorent sa performance, sa réactivité et son efficacité. Avec un taux d'efficacité de plus de 60 %, la pile à combustible dépasse maintenant tout moteur à combustion. Elle comprend 330 cellules individuelles logées à l'avant de la structure.

Situés sous l'habitacle ou le compartiment à bagage, les trois réservoirs d'hydrogène ne modifient pas l'habitacle du véhicule. À une pression de 700 bar, ils stockent suffisamment d'hydrogène avec une autonomie maximale de 600 kilomètres. Chaque réservoir se compose de plusieurs couches : la cuve intérieure en polyamide étanche au gaz est enveloppée de fibre de carbone renforcée de polymère (CFRP) et de

fibres de verre renforcées de polymère (GFRP). Comme un véhicule avec moteur à explosion, le ravitaillement prend environ quatre minutes.

Amplificateur de puissance : la batterie fournit jusqu'à 100 kW de puissance

En plus de la pile à combustible développant jusqu'à 110 kW (150 ch), l'Audi h-tron quattro concept possède une batterie lithium-ion compacte conçue pour optimiser sa puissance. La batterie, d'un poids inférieur à 60 kilogrammes, est située sous l'habitacle passager pour optimiser le centre de gravité. Elle peut fournir jusqu'à 100 kW (136 ch) de puissance, un boost supplémentaire lors d'une accélération et se recharge au freinage. Avec 550 Nm de couple, l'Audi h-tron quattro concept accélère de 0 à 100 km/h en moins de sept secondes ; sa vitesse de pointe est limitée à 200 km/h.

La puissance de la pile à combustible et de la batterie haute-performance entraîne deux moteurs électriques - un situé sur l'essieu avant d'une puissance de 90 kW (122 ch), l'autre sur l'essieu arrière et développant 140 kW (190 ch). Ce fonctionnement en fait donc un système quattro électrique. Un système intelligent de gestion active l'un ou l'autre des moteurs en fonction de la situation pour une efficacité maximale. Une pompe à chaleur pour la climatisation et un grand toit à panneaux solaires génèrent jusqu'à 320 watts et ajoutent jusqu'à 1.000 kilomètres d'autonomie supplémentaire chaque année.

Zéro émission avec de l'hydrogène renouvelable produit à partir de l'Audi e-gas à Werlte, Allemagne

Selon le cycle NEDC, la consommation de carburant est d'environ un kilogramme d'hydrogène pour 100 kilomètres. Non seulement l'Audi h-tron quattro concept est un véhicule zéro émission, mais qui plus est, il fonctionne grâce à un hydrogène produit à base d'énergie verte à l'usine Audi e-gas en Allemagne du Nord.

En 2013, une centrale à gaz utilisa pour la première fois de l'électricité produite par énergie éolienne afin de décomposer, par électrolyse, l'eau en oxygène et hydrogène. Dans un procédé plus avancé, le gaz réagit au CO₂ pour produire l'Audi e-gas, ou le méthane synthétique, pour l'Audi A3 g-tron* et l'Audi A4 g-tron* avec système CNG.

De nombreux clients utilisent déjà la carte de carburant Audi e-gaz pour se ravitailler via le réseau de gaz naturel existant dans les stations CNG. Cela leur permet de



conduire en ne rejetant quasiment pas d'émissions de CO₂. À l'avenir, il sera possible d'exploiter cette source d'hydrogène afin que les voitures à pile à combustible puissent fonctionner avec un carburant respectueux du climat.

Centre névralgique pour la conduite pilotée : le zFAS

La conduite de l'Audi h-tron quattro concept procure de nombreuses sensations. Il est équipé de toutes les technologies que le constructeur aux anneaux a développé pour la conduite pilotée : des capteurs radars, des capteurs à ultrasons, un nouveau type de caméra vidéo et un scanner laser.

Les systèmes d'assistance au conducteur sont maintenant gérés par des unités de contrôle séparées. Bientôt, Audi mettra en œuvre cette fonction via un système central : toutes les informations des capteurs disponibles seront traitées par un système d'assistance au conducteur central (zFAS). Ce dernier analyse l'environnement dans sa globalité en temps réel et rend l'information disponible pour les systèmes d'assistance et les systèmes de conduite pilotée. Ils peuvent aider le conducteur au stationnement ou dans les embouteillages, sur l'autoroute à des vitesses allant jusqu'à 60 km/h.

Audi est le constructeur pionnier dans ce domaine depuis de nombreuses années et la technologie entrera en production pour la première fois en 2017 avec la prochaine génération de berline Audi A8.

Elégant et épuré : L'extérieur

Le design extérieur du concept cinq portes allie esthétique et aérodynamique. L'Audi h-tron quattro concept mesure 4,88 mètres de long, 1,93 mètre de large et 1,54 mètre de hauteur. Sa silhouette, avec une surface vitrée plate qui se rétrécit fortement vers l'arrière, lui confère le caractère dynamique d'un coupé. La ligne d'épaules fluide souligne le contour des roues et symbolise la transmission quattro électrique. Les larges passages de roues et les arrêtes anguleuses soulignent le caractère robuste de la voiture.

Le Cx de 0,27 contribue à la maximisation de l'autonomie et de l'efficacité. Les éléments aérodynamiques sur les flancs, sur le soubassement et à l'arrière améliorent les flux d'airs lorsqu'elle circule à vitesse élevée. Des caméras remplacent les rétroviseurs extérieurs, améliorant elles aussi l'aérodynamisme et l'efficacité.



Les phares sont en deux parties. La partie supérieure génère la lumière en utilisant la nouvelle technologie Audi Matrix laser de très haute résolution. La partie inférieure, qui correspond aux arêtes de la calandre Singleframe, forment la signature de l'éclairage du concept.

En plus des feux de jour blanc reconnaissables, les éléments OLED (organic light emitting diode) émettent une lumière bleue homogène sur les côtés et vers le haut. Deux grandes entrées d'air sont situées sous la lumière.

La technologie Audi Matrix LED est aussi incorporée dans les seuils de porte. Ils émettent une lumière blanche lorsque le conducteur s'approche du véhicule avec la clé « confort » mains libres. La conduite pilotée est signalée par des lignes horizontales bleues éclairées sur les flancs. Sur le même modèle que les feux avant, les feux arrière se composent de deux éléments. La zone supérieure est composée de neuf unités OLED rouges et la partie inférieure de trois.

Fusion de l'architecture et du concept de commande : l'intérieur

L'Audi h-tron quattro concept offre un intérieur spacieux et confortable pour quatre personnes ainsi qu'un coffre d'une capacité de 500 litres. Un logiciel intelligent fournit une assistance lors du chargement : deux capteurs scannent les bagages et affichent l'ordre de chargement optimal sur un écran positionné sur la découpe arrière.

L'intérieur de l'Audi h-tron quattro concept procure une impression de légèreté et d'ouverture, son architecture se fond harmonieusement avec le concept de commande et d'affichage. Les trois grands écrans face au conducteur utilisent la technologie OLED - leurs très minces écrans peuvent virtuellement prendre n'importe quelle forme. Deux écrans tactiles s'ajoutent à l'écran central incurvé OLED Audi virtual cockpit. Celui de gauche contrôle les lumières et les systèmes de conduite pilotée tandis que celui de droite permet de gérer les médias, la navigation, et affiche les états de fonctionnement du système de conduite. Le volant fonctionne comme une commande supplémentaire, ses branches sont équipées de contours tactiles.

Le levier du sélecteur positionné sur la console du tunnel central permet de choisir le mode de conduite. Deux autres écrans OLED permettent de contrôler l'état de conduite, l'air conditionné et le choix des fonctions d'informations programmables. L'écran positionné à l'avant permet des commandes gestuelles. Les écrans incurvés dans la partie avant des portes servent de rétroviseurs extérieurs numériques.

Les deux passagers arrière sont assis dans de confortables sièges individuels. Ils peuvent partager des données avec le conducteur via les tablettes Audi. Les tablettes



sont équipées d'écrans OLED et sont conçues comme un système de divertissement pour les places arrière.



At a glance

The concept car Audi h-tron quattro concept

Technology

- Fuel cell drive with additional lithium-ion battery for boosting and recuperation
- Fifth-generation fuel cell, new materials for added efficiency
- Range of up to 600 kilometers (*372.8 mi*) on one tank of fuel, consumption around one kilogram (*2.2 lb*) of hydrogen per 100 kilometers (*62.1 mi*), refueling takes around four minutes
- Fuel cell performance: up to 110 kW, extra boost of up to 100 kW for short periods, system torque in excess of 550 Nm (*405.7 lb ft*)
- From 0 to 100 km/h (*62.1 mph*) in less than 7 seconds, top speed electronically governed at 200 km/h (*124.3 mph*)
- Electrified quattro layout: one electric motor at front and one at rear, intelligent control strategy for interaction between power units
- Three hydrogen tanks with total capacity of around six kilograms (*13.2 lb*) at 700 bar
- Chassis with adaptive air suspension sport and 22-inch wheels
- Technologies for piloted driving and parking, central driver assistance system (zFAS)

Aerodynamics and design

- SUV with sporty styling, low greenhouse, tapered rear end
- Length 4.88 meters (*16.0 ft*), width 1.93 meters (*6.3 ft*), height 1.54 meters (*5.1 ft*), five doors
- C_d value of 0.27, elaborate detailed measures such as cameras instead of exterior mirrors and movable aerodynamic elements on underbody, sides and rear
- Outstanding aeroacoustics
- Lighting design with OLED elements at front and rear, headlights in Matrix laser technology
- World's largest in-car solar roof, up to 320 watts output or additional range of up to 1,000 km (*621.4 mi*) per year



Interior

- Optimized package: ample space for four persons, large luggage compartment with capacity of 500 liters (*17.7 cu ft*), “luggage butler” for optimum, quick stowing of luggage items
- Heat pump for high-efficiency climate control
- Progressive interior design, fusion with operating and display concept
- Audi virtual cockpit curved OLED as instrument cluster
- Mobile Rear Seat Entertainment with OLED Audi tablets
- Steering wheel with touch surfaces in the spokes
- Online connectivity via LTE, broad range of connectivity functions



Full version

**Fuel cell drive for efficiency and power
– the sport SUV Audi h-tron quattro concept**

The brand with the four rings is unveiling its concept car Audi h-tron quattro concept at the NAIAS 2016 in Detroit – a sporty SUV that uses hydrogen as its energy source. The concept car combines a highly efficient fuel cell achieving an output of up to 110 kW with a battery that provides a temporary boost of 100 kW. Audi’s fuel cell technology paves the way for sustainable mobility with the sporty performance for which the brand is renowned.

The Audi h-tron quattro concept uses only around one kilogram (2.2 lb) of hydrogen per 100 kilometers (62.1 mi). It takes only about four minutes to fill the tank, giving the car a range of up to 600 kilometers (372.8 mi). The conspicuously aerodynamic design with a C_d value of 0.27 plays a major part in its outstanding efficiency.

In another major step, Audi will go into production with its new technologies for piloted driving and parking in 2017 along with the next generation of the A8 luxury sedan. The technology study already provides a glimpse of things to come.

Perfectly equipped for the future

Audi is drawing on a wide variety of technologies in securing the mobility of the future, and thus providing an attractive proposition for every customer in every market. The concept car Audi h-tron quattro concept is closely related to the purely battery-powered Audi e-tron quattro concept exhibited at the 2015 Frankfurt Motor Show. But a new technical solution now comes into play: The “h” in its name represents the element hydrogen – the energy source for the fuel cell. With the Audi h-tron quattro concept, Audi documents its expertise in all areas of forward-looking technology.

Like the Audi e-tron quattro concept, the concept car takes the second-generation modular longitudinal platform (MLB evo) as its basis. This concept is particularly versatile; even though the energy sources differ, both cars share an almost identical floor assembly.



The fuel cell

In the concept car, the fuel cell is installed in the forward structure. Its 330 cells form what is known as a “stack.” Depending on the load point it operates in the voltage range of 220 to 280 volts. The core of each cell is a polymer membrane. On either side there are electrodes coated with a platinum-based catalyst. Hydrogen is supplied to the anode, where it is broken down by the catalyst into protons and electrons. The protons diffuse through the membrane to the cathode, where they react at the catalyst with oxygen from the air and the electrons to form water vapor (the membrane is only permeable for protons, not for electrons).

The Audi h-tron quattro concept demonstrates the fifth generation of fuel cell technology from Audi and Volkswagen. The focus is on new materials for the diaphragms and the bipolar plates that guide the gases in the stack while keeping the cells separate. They help to make the entire unit lighter, smaller, stronger and also more economical, especially as the content of the precious metal platinum has been reduced. The operating life and responsiveness are improved, and hydrogen consumption is cut. The fuel cell now achieves an efficiency of 60 percent, far more than that of a combustion engine.

The fifth-generation fuel cell technology operates at a temperature level of up to 95 degrees Celsius, an increase of 15 degrees compared with the previous generation. A high-efficiency heat pump that absorbs the waste heat from the electrical components and a thermoelectric auxiliary heating element maintain pleasant temperatures inside the car. The car starts with ease at down to minus 28 degrees Celsius.

Powerful boost: lithium-ion battery supplies up to 100 kW of power

Underneath the inside floor, roughly in the middle of the passenger compartment, lies a compact lithium-ion battery weighing less than 60 kilograms (*132.3 lb*) and featuring highly performance-optimized cells. It can temporarily deliver up to 100 kW of power to the electric motors, while its energy capacity is limited to around 1.8 kWh. The storage battery operates over the range of 220 to 460 volts – a high-efficiency triport DC converter in the engine compartment equalizes the difference compared with the fuel cell’s voltage level.



Two power electronics units convert the direct current into alternating current for the two high-performance electric motors. The front electric motor generates 90 kW and the rear one 140 kW. Their housings incorporate planetary gear trains with a single transmission ratio; a mechanical parking lock and a differential function round off the system.

A separate low-temperature circuit keeps the driveline and high-voltage battery components sufficiently cool even when the car is driven sportily.

The e-quattro drive

The Audi h-tron quattro concept is equipped with electrified quattro drive. Each motor powers one set of wheels – as on the technology demonstrator Audi A7 Sportback h-tron quattro, which Audi presented in November 2014. The torque can be varied continuously for both axles. Efficiency is the priority for the electric motor management concept. At low loads only the front axle receives propulsive power, and at very low speeds the power is supplied solely by the battery. The e-quattro concept requires precise coordination of the electric motors – the technology study Audi h-tron quattro offers the sporty, stable and high-traction drive of a production car with mechanical quattro drive.

The Audi h-tron quattro accelerates from 0 to 100 km/h (*62.1 mph*) in less than seven seconds; its top speed is governed at 200 km/h (*124.3 mph*). The silent thrust is already available in full from the start. The energy from moderate brake applications is channeled back into the high-voltage battery by the electric motors. The driver can influence the degree of recuperation by selecting either gliding mode or coasting recuperation. The four wheel brakes only cut in if harder or emergency braking is required.

Refueling in four minutes for a range of up to 600 kilometers (372.8 mi)

Like on a car with combustion engine, refueling with hydrogen takes about four minutes. The three high-tech tanks communicate with the refueling system by infrared interface and equalize the pressure and temperature levels. The stainless steel hydrogen tank cap is located on the front right wing of the sporty SUV; its flap opens electrically.



The hydrogen tanks of the Audi h-tron quattro concept differ in size. The front one is installed longitudinally beneath the center console, and the two other tanks transversely beneath the rear seats and luggage compartment respectively. Together with the battery, they are secured to a structural frame. Neither on the fuel cell drive version nor on its purely battery-powered sister model the Audi e-tron quattro concept do the tanks impinge on the interior. This demonstrates the versatility of the new MLB evo platform.

Every tank is made up of several layers – the inner tank from gas-tight polyamide is wrapped in carbon fiber reinforced polymer (CFRP) and glass fiber reinforced polymer (GFRP). Between them, the three tanks can store about six kilograms (*13.2 lb*) of hydrogen at a pressure of 700 bar, sufficient for a range of up to 600 kilometers (*372.8 mi*). According to the New European Driving Cycle, fuel consumption is only around one kilogram (*2.2 lb*) of hydrogen per 100 kilometers (*62.1 mi*) – an amount with an energy content equivalent to about four liters (*1.1 US gal*) of gasoline. Because the exhaust system carries only water vapor, it is made from lightweight polymer; in cold weather, a little water may trickle out of the tailpipes, just as with a cold combustion engine.

Zero global emissions with renewably produced hydrogen from the Audi e-gas facility in Werlte, Germany

The Audi h-tron quattro concept achieves not just zero local emissions, but zero global emissions – if the hydrogen it runs on has been produced from water using renewable energy, as is the case at the Audi e-gas facility in Werlte, Lower Saxony. Since 2013 the world's first power-to-gas plant has been using electricity generated by wind power to break water down into oxygen and hydrogen by electrolysis. In a further process, this gas is currently reacted with CO₂ to produce Audi e-gas, or synthetic methane, for the Audi A3 g-tron* and the A4 g-tron* with CNG drive. Many customers are already using the e-gas fuel card to buy Audi e-gas via the existing natural gas network at conventional CNG filling stations, enabling them to drive almost CO₂-neutrally. But in future it will be possible to tap this hydrogen source so that fuel cell cars can run on this climate-friendly fuel.



The 1.98 meter long (*6.5 ft*) solar roof plays an instrumental role in the technology study's energy management concept – it is the largest and highest-performance such roof in a car. It feeds electricity at up to 320 watts into the battery if the Audi h-tron quattro concept is parked or driven in the sun. In a region such as Central Europe, for example, that means it can contribute an extra range of up to 1,000 kilometers (*621.4 mi*) per year. In summer the solar roof generates enough energy to power the auxiliary ventilation for the interior. That substantially reduces the cooling performance required of the air conditioning system.

Leading role: the piloted driving

The Audi h-tron quattro concept is equipped with all functions for piloted driving and parking that Audi is developing for production use. The combination of radar, camera and surround sensors supplies a complete model of the car's surroundings. A laser scanner monitors the area in front of the car up to 80 meters (*262.5 ft*) away. All the data is brought together in the driver assistance system (zFAS) in real time. The computing power of the zFAS is equivalent to the entire electronics architecture of a well-appointed midsize automobile – but the high level of integration means the board is merely the size of a tablet PC. The zFAS and the surround sensors provide a compelling foretaste of technologies that will soon be going into production at Audi.

The function for piloted driving in congestion currently being developed by Audi will in future reduce the driver's workload in slow-moving traffic on express roads by taking care of the steering at speeds of between 0 and 60 km/h (*37.3 mph*). The system also accelerates and slows down on its own. With piloted parking from Audi, the driver will be able to control the car conveniently from outside, via the remote control key or a smartphone.

New lighting technology with laser and OLED

The concept car generates all main lighting functions with Matrix laser technology, the next step forward in the development of automotive lighting technology. Broken down into hundreds of thousands of pixels, their beam can illuminate the road in high resolution and with extreme precision control – without dazzling oncoming traffic. The use of Matrix laser OLED technology serves to highlight Audi's *Vorsprung durch Technik* specifically in the domain of automotive lighting.



At the front of the car, multiple narrow, individual OLED luminaries are arranged horizontally staggered one above the other. They complement the white daytime running lights signature with blue light that is emitted to the sides and upwards. In the upper section of the grille, slats act as visual ties between the five OLED (organic light emitting diode) elements of each lighting signature. Each of these combines an LED luminary with a flat OLED element. The OLEDs produce particularly homogeneous light and can create various different lighting scenarios.

Similar to the units up front, the rear lights are also split into two zones. The upper section contains nine upright OLED units that assume the tail light functions. There are three more horizontally staggered units below these.

The OLED displays: the next step for the display concept

The operating and display concept of the Audi h-tron quattro concept harmonizes perfectly with the sculptural, driver-oriented architecture of the cockpit, which is dominated by large OLED displays. Here Audi is continuing the line of its most recent concept studies – some details will make their way into production vehicles in the foreseeable future.

The middle of the three displays in front of the driver is the new Audi virtual cockpit curved OLED, a free-standing, thin OLED display with a narrow aluminum clip and a gently curving surface that renders all displays very easy to see. Its free-form shape transcends the hitherto customary rectangular format, all thanks to OLED technology with its wafer-thin films. Animated graphics give the two-dimensional displays a 3D look. In the main menu the Audi virtual cockpit curved OLED shows the speed, the fuel level of the hydrogen tanks and the range.

On the left and right below the Audi virtual cockpit curved OLED, there are two touch displays. The left display enables the driver to control the lighting functions and the systems for piloted driving. The 14-inch display on the right is asymmetrical, just like the instrument cluster. It is used to control media lists and navigation maps, and shows the h-tron-specific operating status.



Two further displays are located on the center console. One is fitted flush with the console and displays the selected drive status. The front display, which is curved upward, offers gesture controls and visualizes the climate control system, which is operated using virtual sliders. The driver can also use it to call up information such as weather, appointments or addresses using freely assignable preset buttons.

There are also two displays, again with gently curving surfaces, in the front section of the doors. These serve as digital exterior mirrors. Their specially processed camera image is bright even in poor light conditions, offers high contrast and is glare-free. Their position in the doors is ergonomically optimized, thus improving safety.

The operating concept of the Audi h-tron quattro concept makes it possible to manage a wide range of functions via the flat-bottomed, highly dished steering wheel. Its horizontal spokes feature touch surfaces, with fine contours in the glass acting as guides for the thumbs. Each input is followed by a gentle vibration to provide haptic confirmation. The flat, wide selector lever on the center console incorporates a button for the driving programs on its left side.

The OLED-based mobile Rear Seat Entertainment

The rear passengers in the Audi h-tron quattro concept have two Audi tablets with OLED displays at their disposal. Designed as a mobile Rear Seat Entertainment concept, they can be disengaged from their holders on the front seats for use outside the car, too. In the car, they can also be used to share media data with the driver. The concept study is connected to the Internet using the fast LTE (4G) standard. The passengers can surf and send mail as much as they wish, while the driver benefits from the services available in the Audi connect portfolio.

High-tech from Audi: the chassis

The chassis, too, highlights the character of the Audi h-tron quattro concept. The adaptive air suspension sport – the air suspension with controlled damping – contributes to efficiency. It lowers the body in two stages by up to 30 millimeters (1.2 in) as the speed increases, thus reducing drag. The driver can regulate the adaptive air suspension sport via the Audi drive select system.



The front and rear axles are lightweight, five-link constructions made of aluminum and high-strength steel. The 22-inch wheels are equipped as standard with reduced rolling resistance tires of size 265/40 R22. The large ceramic brake disks measure 20 inches in diameter on the front axle, and 19 inches on the rear axle.

The package: ample space for four

Thanks to its optimized use of space, the Audi h-tron quattro concept offers plenty of room for passengers and luggage. The driver and up to three passengers sit on sporty individual seats; rear leg room is generous. Despite the sporty cut of the roof, all of the car's occupants have ample headroom. The luggage compartment in the standard configuration has a capacity of 500 liters (*17.7 cu ft*), which increases to 1,610 liters (*56.9 cu ft*) when the rear seat backrests are folded down.

Audi has devised a new, intelligent technology for loading the luggage compartment. Two sensors on the tailgate trim monitor the items of luggage standing behind the car. A software function calculates the best way to arrange the items in the luggage compartment. A seven-inch monitor mounted on the rear cutout shows the driver the best order in which to load them.

Highly streamlined: the exterior design

Measuring 4.88 meters (*16.0 ft*) in length, 1.93 meters (*6.3 ft*) wide and with a 2.91 meter (*9.5 ft*) wheelbase, the Audi h-tron quattro concept is positioned between the Audi Q5 and the Audi Q7 SUVs. But at just 1.54 meters (*5.1 ft*) tall, it is much lower in height than the two production models. The greenhouse is particularly low, the roof line drops down again quickly and the D-posts are correspondingly flat, giving the body shape markedly coupe-like traits.

The design language of the technology study has been developed in close collaboration between aerodynamics engineers and designers. The drag coefficient of 0.27 enables the Audi h-tron quattro concept to cut through the wind with ease and also plays a major role in the car's high range of up to 600 kilometers (*372.8 mi*). The aerodynamic concept includes a long body along which the air flows cleanly, a tapered tail end with sharp separating edges, plenty of fine-detailing on the outer skin and the wheels, and an aerodynamically optimized floor pan with newly designed microstructures. These draw inspiration from the bionic model of shark skin.

The Audi h-tron quattro concept sports aerodynamic elements on the flanks and at the rear. At speeds of 80 km/h (*49.7 mph*) upward, they direct the flow of air to improve its movement around the vehicle.

Thanks to the refined aeroacoustics, the level of wind noise in the Audi h-tron quattro concept is impressively low even when traveling at speed.



The front end of the Audi h-tron quattro concept creates an impression of width, power and poise. The Singleframe grille is almost completely open. This is attributable to the higher amount of cooling air required by the fuel cell drive than by a battery-powered car. Behind the Singleframe grille and the large air inlets there is one radiator on either side.

In the upper section of the grille, slats act as visual ties between the five OLED (organic light emitting diode) elements of each lighting signature. Each of these combines an LED luminary with a flat OLED element. The OLEDs produce particularly homogeneous light and can create various different lighting scenarios.

The frame of the grille is made from brushed aluminum with polished edges, and it displays an h-tron logo in the lower clip. A compact sensor rack is integrated discreetly into the grille – it includes most of the sensors for the driver assistance systems and the new systems for piloted driving.

Aerodynamically shaped: the flanks

The side view, too, expresses the character of the concept car. The flowing shoulder line forms distinctive blister contours above the aerodynamically optimized wheels in a nod to Audi's quattro genes. Between the shoulder line and the greenhouse, there is a striking small-radius fillet that extends visually around the entire body. The door handles recessed into the body lie below the shoulder line. They extend outward electrically when touched.

Small cameras take the place of the exterior mirrors – this is a near-production technology from Audi that offers other advantages in addition to improved aerodynamics and aeroacoustics: it eliminates the blind spot of physical exterior mirrors. Even on tight bends such as hairpin turns on a mountain pass, the view diagonally to the front remains unobstructed.

The wheel arches have wide wheel panels that visually shrink the amount of paneling down the flanks and emphasize the robust character of the Audi h-tron quattro concept. The same applies to the angular side sills. They incorporate a light strip in Matrix LED technology that offers additional new functions: It emits white light when the driver approaches the technology study bearing the remote control key. This "lightway" dynamically adjusts to the position of the driver and accompanies them until they get in. A similar scenario plays out when exiting the vehicle. Two blue horizontal lines light up as distinguishing features during piloted driving.

The side walls end at the rear of the vehicle in vertical separating edges, at which the air flowing around the vehicle separates cleanly. Compact electric motors in the side



sills are activated at higher speeds. These force the rear segments of the strips 50 millimeters (*2.0 in*) outward like a funnel so that the air is directed past the rear wheels.

Highly tapered: the rear end

The greenhouse of the Audi h-tron quattro concept tapers sharply towards the rear. The shoulder line extends across the rear cargo hatch, giving it a clear contour. Running along this line is an LED light guide that joins the rear lights, thus emphasizing the width of the car.

At higher speeds the spoiler on the tailgate extends by up to 100 millimeters (*3.9 in*). At the same time the diffuser extends to the rear. The targeted merging of the air flows from the roof and the underfloor improves the separation of the airflow.

Taut and light: the interior

Taut lines, clear shapes and sinuously stretched surfaces give the interior a clear, light character. The dashboard slopes downward toward the passengers in two levels. The air vents are integrated into the step between them and the large, encircling arc (wrap-around). The center tunnel console seems to float, while providing extra storage facilities. Two easy slots connect the driver's and front passenger's smartphones with the on-board electronics and recharge them inductively.



The dominant color inside the Audi h-tron quattro concept is a cool, technical gray, with a subtle gradation of hues from the top down. The floor is upholstered in fine Nappa leather, and the textile floor mats are made from a thick, rubber-like yarn that is very hard-wearing and affords good grip.

On the seating surfaces and door top shoulders, sporty Alcantara provides a subtle contrast to the soft unicum leather with which the head restraints and backrest tops are covered. The seats have a special stitching pattern with red and yellow contrasting stitching; the dashboard also has a leather surface. The frames and clasps of the controls and seats are made of darkened, brushed aluminum, with polished edges introducing subtle highlights.

Fuel consumption of the models named above:

Audi A3 Sportback g-tron:

CNG consumption in kg/100 km: 3.6 – 3.3**;

Combined fuel consumption in l/100 km: 5.5 – 5.1** (42.8 – 46.1 US mpg);

Combined CO₂ emissions in g/km (CNG): 98 – 89** (157.7 – 143.2 g/mi);

Combined CO₂ emissions in g/km: 128 – 117** (206.0 – 188.3 g/mi)

Audi A4 Avant g-tron:

This vehicle is not yet on sale. It does not yet have type approval and is therefore not subject to Directive 1999/94/EC.

**Fuel consumption, CO₂ emission figures and efficiency classes given in ranges depend on the tires/wheels used.

– Fin –

Le Groupe Audi, avec ses marques Audi, Ducati et Lamborghini, est l'un des premiers constructeurs automobiles et motos du segment haut-de-gamme. Il est représenté sur plus de 100 marchés dans le monde entier et produit sur 16 sites, situés dans 12 pays. Au cours du second semestre 2016, Audi démarrera la production de l'Audi Q5 à San José Chiapa (Mexique). AUDI AG possède plusieurs filiales à 100% dont quattro GmbH (Neckarsulm), Automobili Lamborghini S.p.A. (Sant'Agata Bolognese/Italie) et Ducati Motor Holding S.p.A.(Bologne/Italie).

En 2014, le Groupe Audi a livré environ 1,74 million d'automobiles de la marque Audi, 2 530 sportives de la marque Lamborghini et environ 45 000 motos de la marque Ducati. AUDI AG a atteint un chiffre d'affaires de 53,8 milliards d'€ et un résultat d'exploitation de 5,15 milliards d'€. AUDI AG emploie plus de 80 000 personnes dans le monde entier, dont environ 58 000 en Allemagne. Audi se concentre sur de nouveaux produits et des nouvelles technologies afin d'assurer l'avenir de la mobilité.

En 2014, Audi a enregistré 57 214 immatriculations en France.